Vaccine Tested for Malaria, World's Most Widespread Infectious Disease

A new vaccine against malaria is being tested in Kenya and Mali. In sub-Saharan Africa, the disease, spread by mosquitoes, disables or kills hundreds of thousands of people each year.

Worldwide, malaria and malaria-related anemia kill as many as 2 million people annually; it is the third deadliest infectious disease, after HIV/AIDS and tuberculosis.

But malaria is the most common of the three. According to the World Health Organization, it infects some 300–500 million people annually, while AIDS and tuberculosis infect, respectively, 5.3 million and 8.8 million.

"The majority of deaths are children, because they have not developed adequate immunity to keep from being killed by the parasite," said Dr. E. Anne Peterson, Assistant Administrator for Global Health. "But pregnant women and people with low immunity are also really vulnerable. So it's a twin killer because it is an adult and pediatric disease."

That is why USAID has targeted creating a vaccine that would make the disease less severe, preventing deaths and building children's immunity.

"The antigen—the molecule in the parasite—was discovered to protect monkeys in the 1980s, but the technology for producing the antigen in sufficient quantity and quality to make a human vaccine eluded people for all these years," said Dr. Carter Diggs, senior technical advisor for USAID Malaria Vaccine Development Program.

To help develop a vaccine, USAID recruited a scientist in 1995 to work with Walter Reed Army Institute of Research Malaria Vaccine Program. In 2000, testing on humans was cleared through the U.S. Food and Drug Administration.

"The cooperation between USAID and the U.S. Army was extensive and very productive," said Diggs. "Ultimately, the joint effort attracted a lot of support from other sources."

After initial safety trials in the United States, clinical trials funded by the Bill & Melinda Gates Foundation began in Kenya in 2002 with a safety study on some 50 adults. Participation was voluntary, and all candidates were informed of potential health risks.

The tests showed that the vaccine was safe for adults in Kenya, so testing has been extended in 2003 to about 50 children aged 1–4.

Meanwhile, the U.S. National Institute for Allergy and Infectious Diseases became interested in the project, and is now working with USAID in testing the vaccine on some 40 adults in Mali.

"This is the first vaccine of its type, so we really won't know if it's going to be protective until we do more testing," Diggs said. "The strategy is to have other vaccines in the pipeline that can come right behind this one."

This is very exciting news—a possible victory over one of humanity's worst killers.

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For those living in malarious areas, chemoprophylaxis, such as antimalaria medication taken by travelers for short periods of time, is no longer recommended.

Prevention of the severe impact of malaria is achieved by intermittent treatment in pregnancy and infancy, coupled with use of insecticide-treated bednets (ITNs) and other mosquito control measures. ITNs alone can save up to 1 million lives annually.

If the new vaccine proves effective in children, other issues will need to be sorted out before it can be used widely, including intellectual property rights, a manufacturing facility, and advanced testing to obtain a Food and Drug Administration license, Diggs said. ★

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Walter Reed Army Institute of Research

A technician at the Walter Reed Army Institute of Research monitors fermentation of bacterial cells from which malaria antigens will be extracted to produce the vaccine.